# THE AUSTRALASIAN SPECIES OF THE GENUS *NEMOPALPUS* (PSYCHODIDAE, DIPTERA).

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(*Communicated by I. M. Mackerras.*)

(Two Text-figures.)

[Read 27th June, 1928.]

The remarkably generalized group of Diptera that includes *Nemopalpus* Macquart has been represented hitherto in the Australasian Region only by *Nemopalpus zelandiae* Alexander, found in both islands of New Zealand. The discovery of an undescribed species of the same genus in New South Wales is thus a matter of great interest. The fly was included in collections of crane-flies sent to me by Mr. William Heron and was taken on the Dorrigo Plateau where the collector has made so many discoveries of unusual insects. I am greatly indebted to Mr. Heron for his kind interest in collecting specimens of Tipulidae and related groups.

## *Historical.*

Tillyard (1926) says of *Nemopalpus*: "This genus, placed by some authors in Tanyderidae, unites that family with the Psychodidae, and is probably one of the oldest existing types of Diptera". This concise statement of facts gives us a clear idea of the essentials of the case.

The first species of *Nemopalpus* (spelled *Nemapalpus* in the original), serving as genotype, is *N. flavus* Macquart (1838*a*, 1838*b*) from the Canary Islands. The fly appears to be a very rare one. Loew (1845) and Eaton (1904) evidently possessed additional material, while Becker (1908) who secured a specimen on La Palma, gave a detailed description, with figure. Dr. Elias Santos Abreu (*in litt.*, June, 1924) tells me that during his long residence on the islands he has secured but a single badly preserved specimen, that continued search has revealed no further material, and that he is now inclined to believe that the species is extinct. In any case, the fly, like virtually all of its known relatives, must be held as being excessively rare.

Meunier (1905) proposed the genus *Palaeosycorax* for the Baltic Amber species, *tertiariae* Meunier. This genus is now placed in the synonymy of *Nemopalpus*, as is *Nygmatodes* Loew (1845). Edwards (1921) described a second species from the Baltic Amber as *N. molophilinus*. Alexander (1921) described the New Zealand species, *N. zelandiae*. Tonnoir (1922) summarized our knowledge of the group and described a new species, *N. pilipes*, from Paraguay.

Alexander (1920) proposed the second genus, *Bruchomyia*, for the single known species, *B. argentina* Alexander, of the Argentine.

*Systematic Arrangement of* Nemopalpus *and allies.*

The curiously annectant nature of *Nemopalpus* and *Bruchomyia* is best shown by the systematic positions assigned to the group by the various authors. Macquart (1838*a*, 1838*b*) placed the genus *Nemopalpus* in the Psychodidae. Eaton (1904) placed it in the subfamily Phlebotominae, a course in which he was followed by Tonnoir (1922). Alexander (1920) proposed a new subfamily group, the Bruchomyinae, placing it in the Tanyderidae, in which course he was followed by Cole (1927). Edwards (1921) proposed the new group Nemopalpinae to receive *Nemopalpus*, *Palaeosycorax* and *Bruchomyia*. Crampton (1925) elevated the group to family rank, the Bruchomyidae, later (1926*a*) reducing it to subfamily rank, Bruchomyinae, in the Psychodidae.

As above stated, these diverse assignments of *Nemopalpus* and allies indicate clearly the annectant character of the group. The Oligocene genus of Tanyderidae, *Macrochile*, is another type that must be placed far down in the series (Crampton, 1926*b*) and there can be no reasonable doubt but that this genus and *Nemopalpus* have sprung from some common ancestral type in late Mesozoic times, the former leading to the remaining and higher Tanyderidae, the latter to the more specialized groups of Psychodidae. The actual relationship of *Nemopalpus* and *Macrochile* is much closer than is shown on paper and I know of no other case in the Nematocera where so close a relationship exists and yet requires the respective genera to be placed in different families of flies.

The thoracic morphology of *Nemopalpus* and *Bruchomyia* has been described and figured by Crampton (1925, 1926*a*). The venation has been shown by Becker (1908), Edwards (1921), Alexander (1920, 1928), Tillyard (1926) and Tonnoir (1922). The general appearance of the flies of this subfamily is shown by Alexander (1920, 1928) and Tillyard (1926). The structure of the genitalia by Tonnoir (1922) and Cole (1927).

*Key to the Subfamilies of Psychodidae.*

1. Radial sector, Rs, with four branches ..... 2
   Radial sector, Rs, with three branches ..... TRICHOMYINAE.
2. Distal section of vein $Cu_1$ elongate, extending generally parallel to vein $M_4$, cell $M_4$ at wing-margin approximately equal in width to cell $M_3$; cell Cu sometimes very wide, exceeding cell $M_4$ ..... PSYCHODINAE.
   Distal section of $Cu_1$ short to very reduced, longest in *Bruchomyia*; cell $M_4$ at wing-margin always wider than cell Cu, usually very wide ..... 3
3. Rs pectinately four-branched, $R_4$ being captured by the upper fork of the sector; mouthparts of female elongate, formed for blood-sucking .... PHLEBOTOMINAE.
   Rs dichotomously four-branched, $R_{2+3}$ and $R_{4+5}$ being present; mouthparts normal, not formed for blood-sucking ..... BRUCHOMYINAE.

In some species of *Phlebotomus*, such as *P. signatipennis* Newstead, cell $R_2$ is so reduced in size as to presage its total loss by fusion to the wing-margin of veins $R_2$ and $R_3$. It is very curious and suggestive that in the Phlebotominae the anterior branch of the posterior fork of the primitively dichotomous sector should have been captured by the upper fork, quite as in three tribes of the Limoniine Tipulidae.

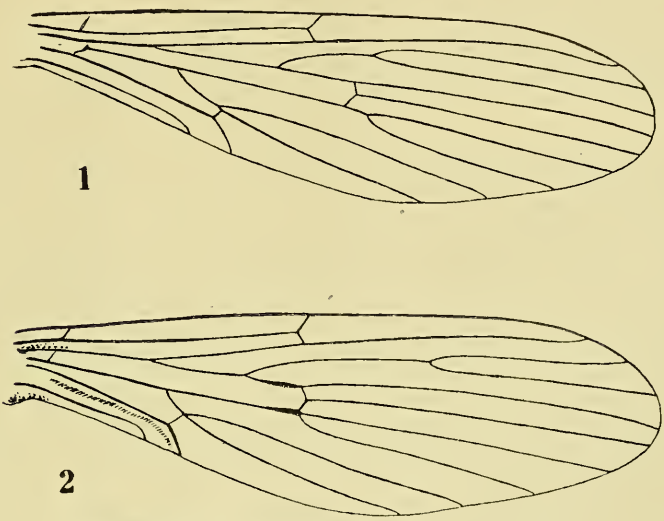
*Key to the Genera of the Bruchomyinae.*

1. Antennae with 30 segments; distal section of vein $Cu_1$ long, approximately as long as the basal section ..... *Bruchomyia* Alexander.
   Antennae with 16 segments; distal section of vein $Cu_1$ short, curved strongly to the anal margin ..... *Nemopalpus* Macquart.

*Key to the Australasian Species of* Nemopalpus.

1. General coloration of the body dark brown, with chiefly dark setae; thoracic pleura dark with a broad pale yellow dorsal stripe; wings without black setae; $R_{2+3}$ relatively short, less than one-half $R_2$ alone (Fig. 1) ..... (New South Wales) *N. australiensis*, n. sp.

General coloration of the body reddish fulvous, the setae concolorous; thoracic pleura uniformly dark fulvous; wings with scattered black setae on the basal half, including a larger area near the fork of M; $R_{2+3}$ elongate, nearly as long as $R_2$ alone (Fig. 2) ..... (New Zealand, both islands) *N. zelandiae* Alexander.




Text-figures 1, 2.—Wing-venation of *Nemopalpus*.
1. *Nemopalpus australiensis*, n. sp.
2. *Nemopalpus zelandiae* Alexander.

NEMOPALPUS AUSTRALIENSIS, n. sp.

General coloration of mesonotum dark brown, the posterior sclerites more yellowish; pleura brownish-black with a dorsal pale stripe that widens out behind; wing greyish-yellow, densely clothed with long trichiae, the costal fringe more cinnamon-brown; $R_{2+3}$ only a little longer than $R_{4+5}$ and less than one-half the length of $R_2$ alone.

*Female.*—Length about 3·5 mm.; wing, 4·2 mm.

Rostrum brown, the palpi pale brown, not conspicuously elongated. Antennae yellow; flagellar segments elongate-cylindrical, with very long brownish-yellow verticils. Head brownish-yellow, darker medially, with very long and conspicuous setae, shorter and more yellowish in front, longer behind.

Posterior pronotum light yellow. Mesonotum dark brown, with very abundant and conspicuous erect pale setae; posterior sclerites of mesonotum passing into testaceous yellow, this including the scutellum, lateral portions of the postnotal mediotergite, most of the pleurotergite, the metanotum, and the dorsal portion of the pteropleurite. Pleura brownish-black, the dorso-pleural region and the more dorsal pleurites pale yellow, as above described. Halteres dusky, the base of the stem pale yellow. Legs with the coxae and trochanters obscure yellow; remainder of legs pale brown, densely clothed with dark setae. Wings subhyaline

to greyish-yellow, the veins with dense fringes of long trichiae, the costal fringe very dense, bright cinnamon-brown, the apical and posterior fringes more yellowish-brown. Venation (Fig. 1): Sc relatively short, $Sc_2$ apparently ending about opposite one-third the length of $R_{4+5}$; $R_{2+3}$ relatively short, considerably less than one-half $R_2$ alone and only a little longer than $R_{4+5}$; cell $M_1$ short-petiolate; m-cu on $M_4$ just beyond its base. Veins $R_{4+5}$ and $M_{1+2}$ not incrassated as in *zelandiae*.

Abdomen brownish-black, with long scattered yellow setae. Ovipositor consisting of two pale yellow, highly compressed, spatulate blades, with a dense brush of dusky setae immediately beneath their origin.

*Hab.*—New South Wales.

*Holotype*, ♀, Brooklana, Eastern Dorrigo, altitude about 2,000 feet, along a stream, November 5, 1927 (Wm. Heron); in the author's collection.

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